Claims

1. A communication system having network nodes (1, 2, 3, 4, 5) of a control and/or drive network (11, 12), wherein for operating industrial machines, in particular printing machines, control and/or regulating signals are exchanged between the network nodes via a closed ringlike signal line (6, 7),

in which one network node (2) exchanges signals with at least one further network node (1, 3) over a bidirectional signal path (10),

in which at least one network node (2) has a switchover unit (8),

in which the switchover unit (8) can be communicate with two further network nodes (1, 3) via two bidirectional signal paths (10),

in which the switchover unit (8) in a first switching position connects the two signal paths (10) in the manner of a bidirectional conduction of the signals through the network node (2),

in which the switching unit (8) in a second switching position interrupts the communication between the two signal paths and connects two signal courses (9) of at least one bidirectional signal path (10) to one another,

characterized in that

the communication system can be configured into various

networks (11, 12) via a suitable connection of the switchover units (8) of the network nodes (1, 2, 3, 4, 5); and

that the networks (11, 12) have separate signal lines (6, 7) from one another.

2. The communication system as recited in claim 1, characterized in that two network nodes (3, 4) of two networks (11, 12) are each mechanically connected to one another via two lines (9) which are embodied between the two network nodes (3, 4).

3. The communication system as recited in one of claims 1 or 2, characterized in that a network node (1, 2, 3, 4, 5) is connected to a control unit (23).

4. The communication system as recited in one of claims 1 through 3, characterized in that each network (11, 12) has one control unit with a master function and at least one control unit with a slave function.

5. The communication system as recited in one of claims 1 through 4, characterized in that the switchover unit (8) is switchable via a software controller.

6. The communication system as recited in one of claims 1 through 5, characterized in that one network (11, 12) is configured in accordance with a leading axis and the dependent following axes of a controller of a machine system; and that all the control units which execute control tasks as a function of the leading axis and all the control units that execute control tasks as a function of following axes of the leading axis are combined into one network (11, 12).

7. The communication system as recited in claim 6, characterized in that the machine system represents a printing machine (18) with a plurality of printing units (21).

8. The communication system as recited in claim 7, characterized in that a control unit (1) is connected to a further ring line (14);

that the further ring line (14) is connected to drive mechanisms (13) of a printing unit (21); and

that the control unit (1) controls the drive mechanisms (13) chronologically synchronously.

9. The communication system as recited in claim 7, characterized in that control units (1, 2, 3) of a plurality of printing machines (18, 20) are connected to one network (11, 12) and are supplied by the network with control signals;

that a control unit performs a master function for the further control units, which perform slave functions.

10. A method for controlling a communication system as recited in claim 1,

characterized in that

a change in the configuration of the networks (11, 12) is performed by means of software commands.

11. The method as recited in claim 10, characterized in that if a malfunction occurs upon data exchange, a change in

the configuration of the network is performed in order to exclude defective signal communication and/or a defective network node or a control unit from one network (11, 12).

12. The method as recited in one of claims 10 or 11, characterized in that the configuration of the network is performed as a function of a configuration of a plurality of machines of a processing group, in particular a printing machine (18).

13. The method as recited in claim 12, characterized in that if a malfunction occurs in a machine of the production group, the network node which supplies the defective machine with control signals is excluded from the network (11, 12).